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Remarks

Claims 1-6 and 9 are pending. Claims 1 and 4 are the only independent claims. Reconsideration and reexamination of the application is respectfully requested.

Applicant respectfully submits that the composite polymeric material defined by the amended claim 1, including the expanded and hardened polyurethane resin matrix in which there are dispersed the pre-expanded, air-filled, polymer granules that have not been melted or broken down by the resin matrix, is patentable over the prior art of record.

The primary reference Broersma (US 5699561) discloses:

- i) expandable polystyrene (E.P.S.) beads or expandable polypropylene (E.P.P) beads filled into a helmet shell (column 2, lines 66-67), and expanded and fused together with heat and optionally water; or
- ii) pre-expanded beads, on their own, and without heat or water, to form the impact attenuating material (column 3, lines 55-59); or
- iii) a two-part urethane foam system including constituents that chemically react and expand in the helmet cavity (column 4, lines 9-19).

It would appear clear that Broersma (US 5699561), only disclosing any one of the three above cited embodiments, does not anticipate applicant's composite polymeric material as defined by the amended claim 1, that includes the expanded and hardened polyurethane resin matrix, and the pre-expanded, air-filled, polymer granules that have not been melted or broken down by the resin matrix, dispersed therein.

Applicant submits that Broersma (US 5699561), also does not provide any teaching that would render the composite polymeric material as defined by the amended claim 1 *prima facie* obvious to a person having ordinary skill in the art.

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According to established case law, in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Firstly, there is clearly no suggestion or motivation to combine, for example, the steps ii) and iii) of **Broersma (US 5699561)** as described above. This appears clear from a detailed analysis of the entire document **Broersma (US 5699561)** itself. It is to be noted in fact that the embodiment ii) of pre-expanded beads is only briefly mentioned at lines 55-59 of column 3, and it is stated that neither heat of any other treatment is required. Moreover, the embodiment iii) of the two-part urethane foam system on its own is only mentioned at the end of the detailed description (column 4, lines 9-19) as an example of an alternative embodiment. From a detailed analysis of the entire document **Broersma (US 5699561)**, it appears clear that there is no suggestion or motivation to a person having ordinary skill in the art to modify **Broersma (US 5699561)** to arrive at applicant's claimed composite polymeric material as defined by the amended claim 1, that includes the expanded and hardened polyurethane resin matrix, and the pre-expanded, air-filled, polymer granules that have not been melted or broken down by the resin matrix, dispersed therein, contrary to the requirements of establishing a *prima facie* case for obviousness.

Moreover, note that applicant's claim 1 includes the claim limitation according to which the expanded polyurethane resin "*has been expanded and hardened about said pre-expanded polymer granules without causing melting or breakdown of said pre-expanded polymer granules that are filled with air*". Applicant submits that this

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claimed limitation is not taught or suggested in Broersma (US 5699561) or anywhere else in the prior art of record, once again contrary to the requirements of establishing a *prima facie* case for obviousness.

Finally, note that applicant's claimed composite material including the non-altered pre-expanded polymer granules uniformly dispersed inside the expanded polyurethane resin matrix advantageously provides for a particularly effective kinetic energy dissipating effect since such non-altered pre-expanded polymer granules are filled with air and can compress under the impact energy and then resume their initial position for providing extremely high impact resistance characteristics (see applicant's original disclosure, page 8, lines 18-28, and the text from page 4, lines 5 to page 6, line 3). From a detailed study of Broersma (US 5699561) and the other prior art of record it would appear clear that these advantageous results are simply not contemplated anywhere in Broersma (US 5699561) and in the prior art of record, once again contrary to the requirements of establishing a *prima facie* case for obviousness.

In view of the foregoing, applicant respectfully solicits allowance of pending claims 1-6 and 9.

Respectfully submitted,



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